



RIFT TD TUTORIAL

UPSTREAM BOUNDARY DEPOSITION

INTRODUCTION

In this tutorial you will develop an upstream tailings deposition model. Deposition takes place from a perimeter boundary into the facility, with deposition points moving into the deposition basin as they are raised.

A copy of the **Rift TD** Users Manual may be useful when working through this tutorial. It is installed during **Rift TD** installation, but can also be downloaded from our [download page](#).

TUTORIAL COMPONENTS

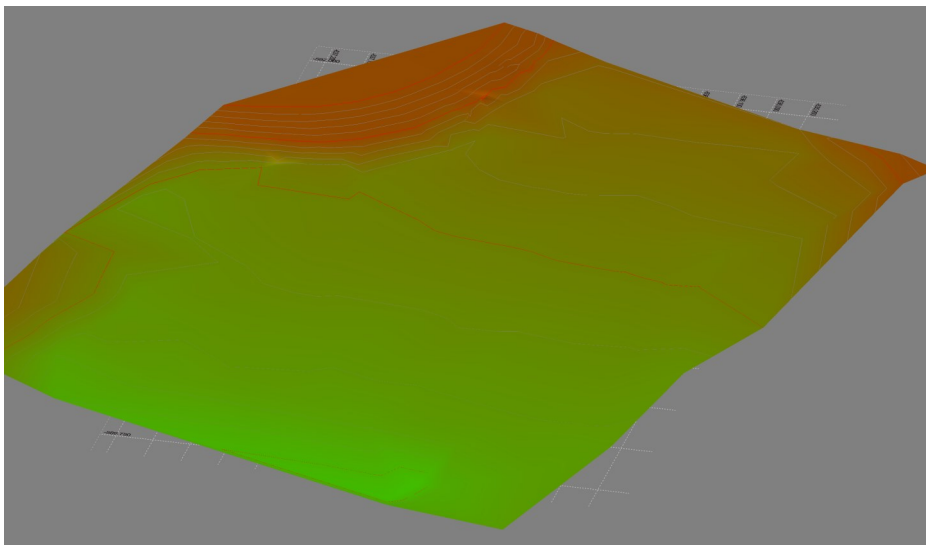
This tutorial comprises:

- This instruction set.
- **Rift TD** files:
 - Base Model.rft: The base model used to develop the deposition surface.
 - Final Model.rft: The final deposition model.
 - Final Model.res: The deposition model result file.
- Text Files (ASCII data files):
 - Survey Data.txt: The ASCII data file used to generate the base topography.
 - Deposition Line.txt: Deposition boundary coordinates.

BASE TOPOGRAPHY

This tutorial provides the **Rift TD data file, Base Model.rft**, as a starting point:

- **Click File > Open.**
- **Select Base Model.rft.**
- **Click Open.**



MODEL DEFINITION

A deposition model comprises:

- Raise Elevations:
- A Vector Slope.
- Beach Profiles.
- Material parameters.
- A Supernatant Pond.
- A Deposition Line.

RAISE ELEVATIONS

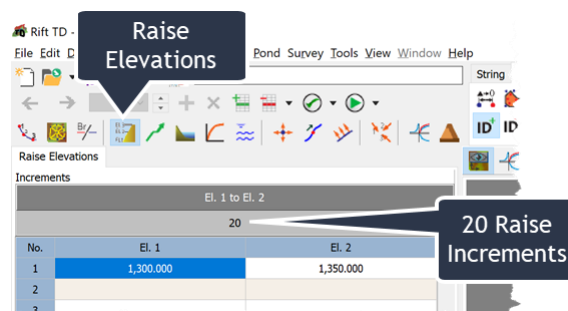
Raise Elevations define the elevations that deposition vectors will be **raised to**, and the **raise increment**.

In this tutorial you will raise deposition vectors from their initial elevation of

- 1300 m; to an elevation of
- 1350 m; in
- 20 raises i.e. 2.5m raise increments.

To **set** the **Raise Elevations**.

- **Activate Raise Elevations:**
 - Click **Edit > Raise Elevations**; or
 - Click the **Raise Elevation Tool-button**.
- Enter **20 Raise Increments** on the **Raise Increment Grid**.
- On the **Data Grid**:
 - Enter an **initial elevation, El. 1**, of **1300 m**.
 - Enter a **final elevation, El. 2**, of **1350 m**.



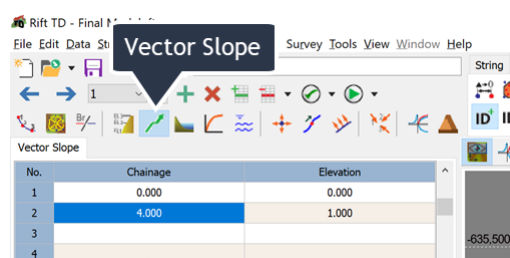
VECTOR SLOPE

A **Vector Slope** defines how deposition vectors move horizontally as they are raised vertically.

In this tutorial you will specify a **Vector Slope** of **1 Vertical in 4 Horizontal**.

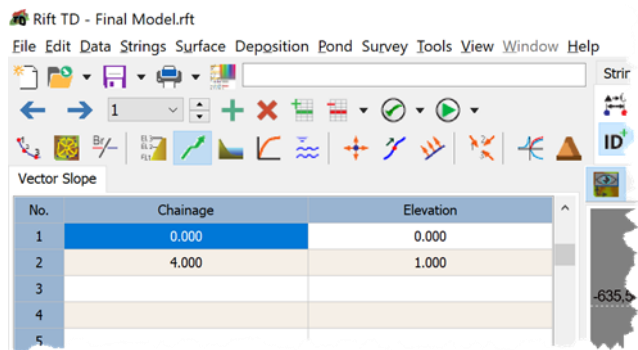
To **define** the **Vector Slope**:

- **Activate Vector Slopes:**
 - Click **Edit > Vector Slope**; or
 - Click the **Vector Slope Tool-button**.



- Enter the **Vector Slope** on the **Data Grid**:

- Row 1:
 - Chainage: 0.00.
 - Elevation: 0.00.
- Row 2:
 - Chainage: 4.00.
 - Elevation: 1.00.



BEACH PROFILE

Beach Profiles define a **longitudinal section** along a **beach**.

A typical model has two beach profiles:

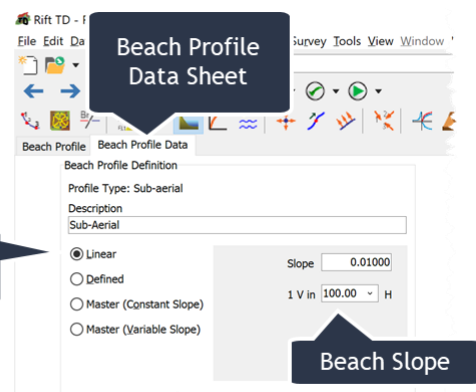
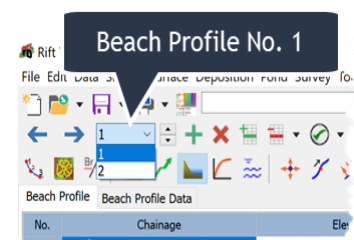
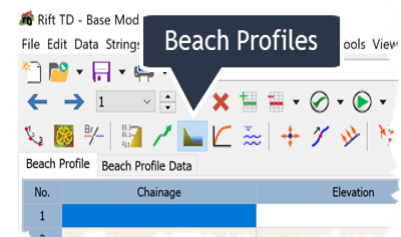
- **Sub-aerial profile**: The beach profile above the supernatant pond.
- **Sub-aqueous profile**: The beach profile below the supernatant pond.

You will define both profiles as linear profiles with a:

- Sub-aerial slope of 1V:100H.
- Sub-aqueous slope of 1V:50H.

To **define** the **Beach Profiles**:

- Either:
 - Click **Edit > Beach Profiles**; or
 - Click the **Beach Profiles Tool-button**.
- If not active, use the **Navigation toolbar** to **activate Beach Profile No. 1**.
- Click on the **Beach Profile Data Sheet**.
 - Enter a **description** of "Sub-Aerial".
 - Set the **profile type** to **linear**.
 - Enter a **beach slope** of **1V in 100H**.
- Use the **Navigation Toolbar** to **activate Beach Profile No. 2**:
 - Enter a **description** of "Sub-Aqueous".
 - Set the **profile type** to **linear**.
 - Enter a **beach slope** of **1V in 50H**.



MATERIAL

Materials define:

- The **Deposition Rate** over time [mass per day].
- The **Complex Beach Profile** comprising a:
 - Sub-aerial profile, a
 - Sub-aqueous profile, and if necessary, a
 - Cyclone profile.
- **Material densities**.

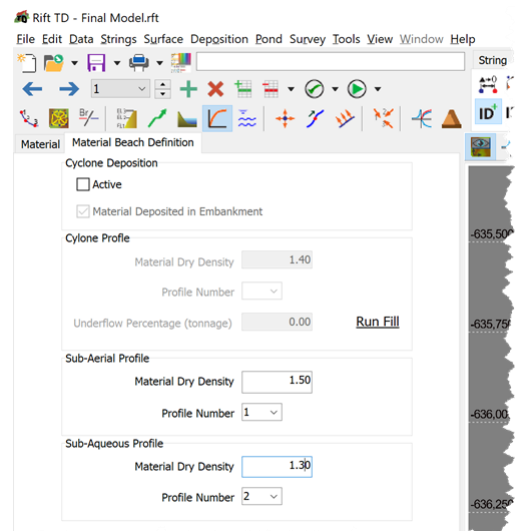
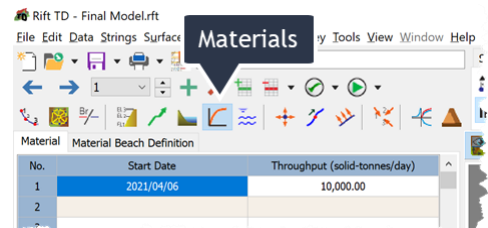
In this tutorial you will **define**:

- A **throughput** of **10,000 tonnes per day**.
- **Use** the two previously defined **Beach Profiles** to **define** the **complex beach profile**.
- **Sub-aerial** and **sub-aqueous densities** of **1.5** and **1.3 tonnes/m³** respectively.

To **define** the **Material**:

- **Activate Materials**:
 - **Click Edit > Materials**; or
 - **Click the Material Tool-button**.
- On the **Data Grid** **enter**:
 - A **start date** of **6 April 2021**.
 - A **throughput** of **10,000 tonnes per day**.
- **Click** the **Material Beach Definition Sheet**.
 - **Ensure** that **Cyclone Deposition** is **NOT Active**.
 - **Set** a **sub-aerial density** of **1.5 tonnes/m³**.
 - **Use** the **Sub-aerial Profile Drop Down Box** to **set** the **Sub-aerial Beach Profile** to **Beach Profile No. 1**.
 - **Enter** a **sub-aqueous density** of **1.3 tons/m³**.
 - **Use** the **Sub-aqueous Profile Drop Down Box** to **set** the **Sub-aqueous Beach Profile** to **Beach Profile No 2**.

Cyclone Profiles are used to model beach cyclone deposition and are not required for this model.

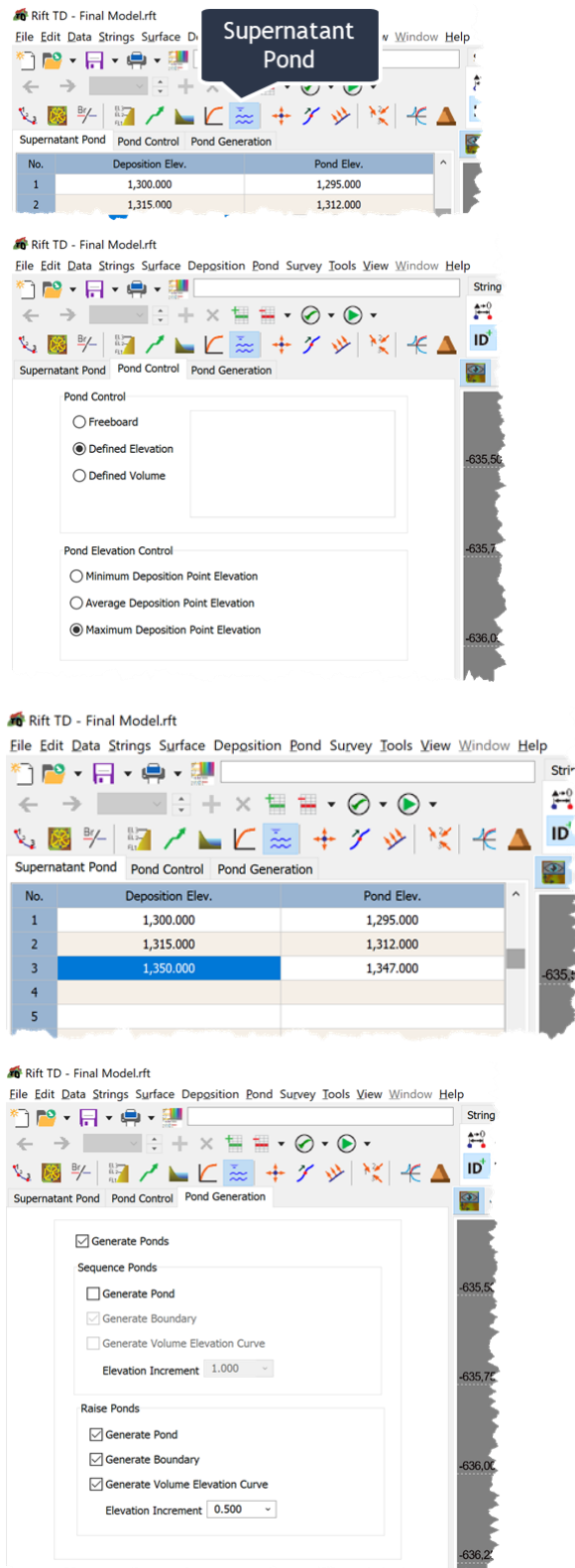


SUPERNATANT POND

The **Supernatant Pond** defines the **interface between the sub-aerial and sub-aqueous beaches**. In this tutorial you set a **defined Pond Elevation** relative to the **Maximum Deposition Point Elevation**.

To **define** the **Supernatant Pond**:

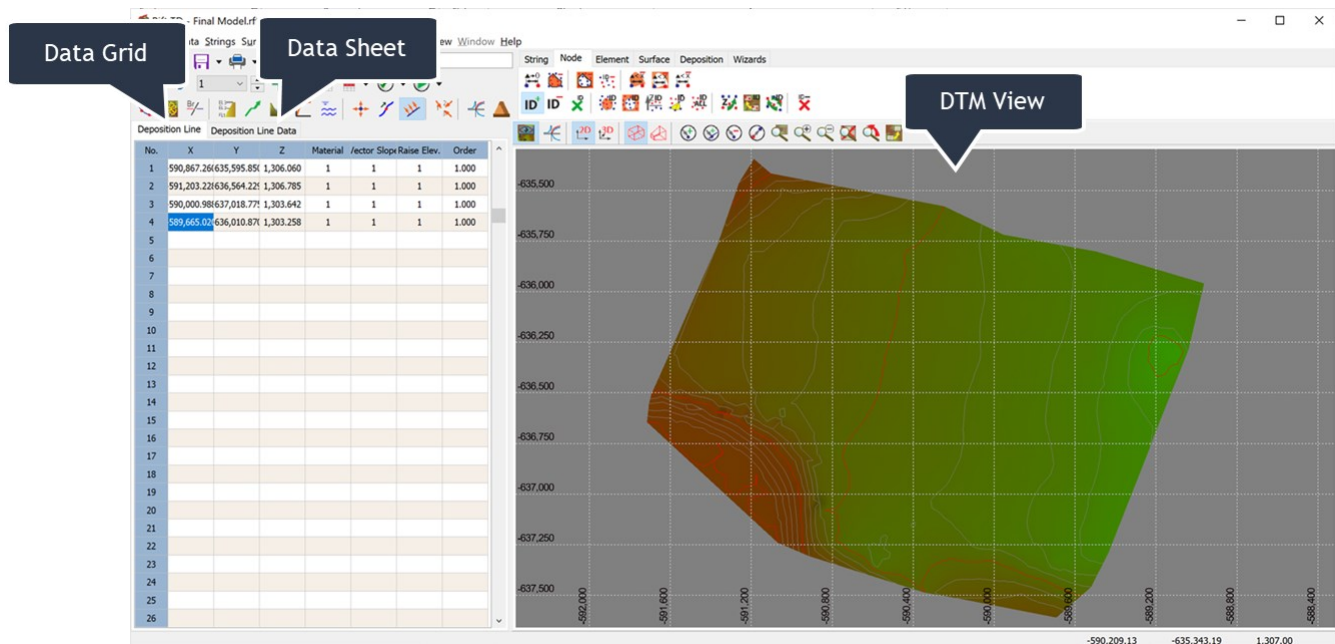
- **Activate** the **Supernatant Pond**:
 - **Click Edit > Supernatant Pond**; or
 - **Click** the **Supernatant Pond Tool-button**.
- **Select** the **Pond Control Data-sheet**.
 - **Set** the **Pond Control** to **Defined Elevation**.
 - **Set** the **Pond Elevation Control** to **Maximum Deposition Point Elevation**.
- **Select** the **Supernatant Pond Data-sheet**:
 - **Enter Deposition Elevation/Pond Elevations** of:
 - 1,300 1,295
 - 1,315 1,312
 - 1,350 1,347
- **Select** the **Pond Generation Data-sheet**:
 - **Check Generate Ponds**.
 - **Sequence Ponds**:
 - **Uncheck Generate Ponds**.
 - **Raise Ponds**:
 - **Check Generate Raise Ponds**.
 - **Check Generate Raise Pond Boundary**.
 - **Check Generate Volume Elevation Curve**.
 - **Enter** an **elevation increment of 0.5 m**.



DEPOSITION LINE

Deposition Lines generate **Deposition Vectors** from which deposition takes place. **Deposition Lines** have the following parameters:

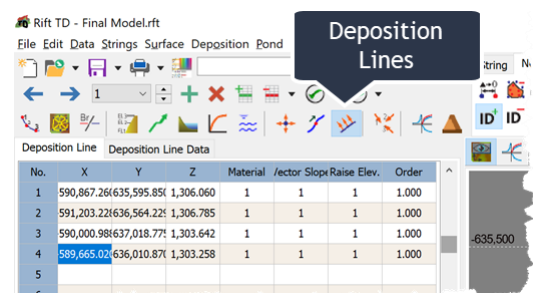
- On the **Data Grid**:
 - Coordinates.
 - Materials.
 - Raise Elevations.
 - Vector Slopes.
- On the **Deposition Line Data Sheet**:
 - Deposition Direction.
 - Vector Direction.



- Vector Spacing.

To **define** the **Deposition Line**:

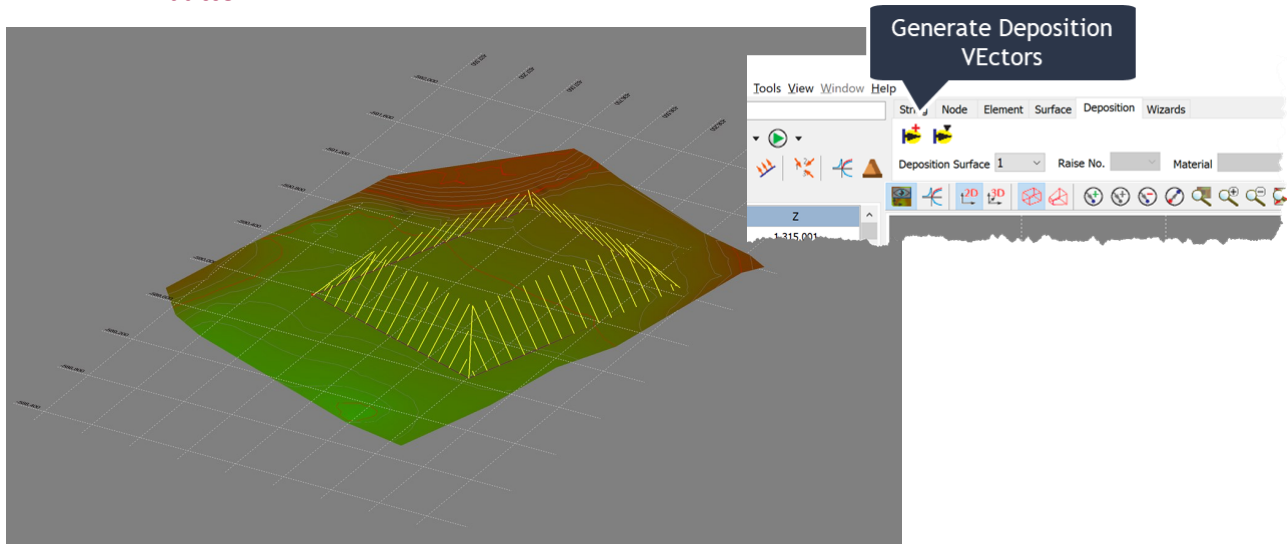
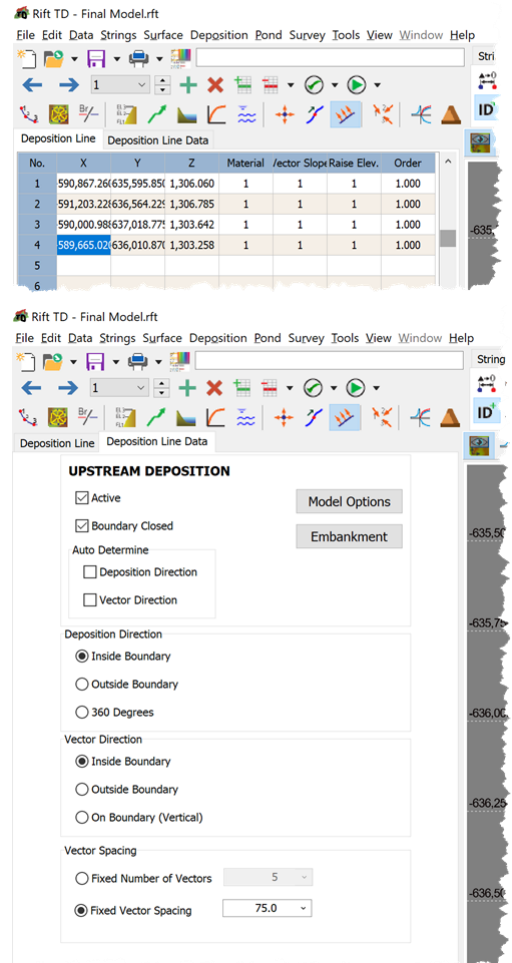
- **Activate Deposition Line**:
 - Click **Edit > Deposition Lines**, or
 - Click **Deposition Line Tool-button**.
- **Define** the **Deposition Line** visually on the **DTM View**:
 - Click **Data > Edit in View > Add**; or
 - Click the **View Add Tool-button**; or
 - **Right click** on the **DTM View** and **click Data > Add**.



- Click on the **DTM View** to **define** the **Deposition Line Coordinates**.
- **Deactivate DTM View Add Data**:
 - Press **Escape**; or
 - Click **Data > Edit in View > Add**; or
 - Click the **View Add Tool-button**; or
 - **Right click** on the **DTM View** and **click Data > Add**.
- On the **Data Grid**:
 - Enter the **indices** for the previously defined:
 - **Material No. 1.**
 - **Vector Slope No. 1.**
 - **Raise Elevation No. 1.**
 - Enter a **Deposition Order of 1.**
 - Click the **Deposition Line Data-sheet**.
 - On the **Deposition Line Data Sheet set**:
 - The **Deposition Line** to **Active**.
 - The **Boundary** to **Closed**.
 - The **Deposition Direction** to **Inside Boundary**.
 - The **Vector Direction** to **Inside Boundary**.
 - A **Fixed Vector Spacing** of **75 m**.
 - **Generate** the **Deposition Vectors**:
 - Click **Deposition > Deposition Vector > Generate All Vectors**; or
 - Click the **Generate Deposition Vector Tool-button**.

You can import coordinates. This tutorial includes an **ASCII file**, **Deposition Line.txt**, that has the **Deposition Line** definition.

Click **File > Import > ASCII** to **import** the data.



To **run** the **deposition** model:

- Either:
 - **Click Run > Run Model**; or
 - **Click** the **Run Tool-button**.
- If the result file already exists:
 - You are **prompted** for a **Result File Name**. **Click Ok** to retain the existing file.
 - **Select Overwrite File** on the **Set Result File Task Dialog**.

After the model run **Deposition Results** are **shown** on the **Data Grid** and the **Result View**. A **tutorial** on **Deposition Result Output** is available at riftxone.com.

